REMARKS

The Office Action mailed on August 28, 2002 has been received and reviewed. Claims 1 through 15 are currently pending in the application and stand rejected. Reconsideration of the above-referenced application is respectfully requested.

35 U.S.C. § 102(b) Anticipation Rejection

Claims 1 stands rejected under 35 U.S.C. § 102(b) as being anticipated by Gelman et al. (U.S. Patent No. 4,025,438, hereinafter "Gelman") or Grosshandler (U.S. Patent No. 4,059,528, hereinafter "Grosshandler"). Applicant respectfully traverses this rejection, as hereinafter set forth.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Applicants respectfully submit that independent claim 1 is not anticipated by Gelman or Grosshandler because each and every element as set forth therein is not found, either expressly or inherently described, in Gelman or Grosshandler. In particular, among other recited elements, either Gelman or Grosshandler does not teach or disclose the recited fractal elements of claim 1.

Applicant has clearly defined the term fractal in the specification of the above-referenced application. On paragraph **[0034]** one reads:

> "The term "fractal" as used in this disclosure, refers to a device constructed as a distributor or collector (128 or 136) having outlets or inlets connected through conduits constructed and arranged substantially in accordance with the principles of fractal geometry. Fractal structures are mathematical constructs which exhibit scale invariance. In such structures a self-similar geometry recurs at many scales. Typical distributors or collectors 128 or 136 are desirably configured of conduit arranged in fractal patterns using any well known fabrication techniques, such as matrices of pipe, molded or machined tiles, or stamped plate. The outlet or inlet orifice density can be increased by recursively duplicating a basic pattern (fractal) on smaller and smaller scale."

The subject matter of Gelman is a water filtering device for attachment to a faucet and a replaceable water filtering cartridge for use in such device (Gelman, col. 1, lines 5-9). The device comprises a generally tubular passage 2 having a portion 12 of relatively small diameter and a portion 14 of relatively large diameter. The relatively small diameter portion 12 of the passage is surrounded by an annular water filtering chamber 16. A plurality of radially extending openings 18, which are in the form of tapered grooves in the inner surface of the lower wall of chamber 16, provide communication between the lower axial end of the chamber 16 and the large diameter portion 14 of the passage 2. Likewise, a plurality of radially extending openings 20, which are in the form of tapered grooves in the inner surface of the top wall of chamber 16, provide communication between the passage adjacent the upper end, as shown, of the small diameter portion 12 of the passage and the upper axial end of the water filtering chamber 16 (*Id.*, col. 2, lines 1-38). When the sleeve 19 is turned in a direction to cause it to move axially upwardly with respect to large diameter portion 14 of the passage, the washer 28 engages and blocks the lower end of the small diameter portion 12 of the passage and thereby blocks any flow of water from the small diameter portion 12 of the passage directly to the large diameter portion 14 of the passage. With the valve closed to block the flow of water directly from passage portion 12 to passage portion 14, water from the faucet is caused to flow from the small diameter portion 12 of the passage through the openings 20 through the filter chamber 16 and then through the openings 18 into the large diameter portion 14 of the passage, and from there to exit from the bottom of the passage 2. With the sleeve being turned in one rotary direction such that the valve constituted by washer 28 is open, the water from the faucet is allowed to flow directly from the small diameter portion of the passage to the large diameter portion of the passage and exit there from thereby bypassing the filter chamber 16 (*Id.*, col. 2, line 52 – col. 3, line 15).

Grosshandler relates to a cartridge or self-contained filter element or sorption bed which can be rapidly replaced when it has become saturated with a contaminant (Grosshandler, col. 1, lines 5-8). A cartridge 10 comprises in cooperative combination a first frame portion 11a and a second frame portion 11b maintained in mating fixed relationship by means of a plurality of fastening means or bolts 13. The frame 11 defines an inwardly facing annular channel 15 and the

frame portion 11b defines a generally rectangular fluid passage opening 16. Disposed within and retained by frame 11 is a first rigid foraminous sheet 17 disposed immediately adjacent and within the opening 16 of frame portion 11b. A second generally foraminous rigid sheet 18 is disposed adjacent foraminous sheet 17 and is generally coextensive with the sheet 17. A flexible foraminous sheet 19 is disposed immediately adjacent the sheet 18 and remote from the sheet 17. The sheet 19 is generally coextensive with the sheet 18 and at least a portion of the groove 15. A similar series of sheets equivalent to sheets 17, 18 and 19 are disposed within the opening of the frame portion 11a and are similarly arranged. An internal generally rectangular frame 21 is disposed within the frame 11. A particulate sorptive bed 22 is disposed within the cartridge 10 and is immediately adjacent the flexible foraminous sheet 19 and its counterpart disposed in frame portion 11a (*Id.*, col. 2, lines 27-68).

The Office cites FIGS. 2 and 3 of Gelman and FIG. 1 of Grosshandler as having fractal elements (Office Action, page 2, lines 14-17). Applicant respectfully submits that Gelman's plurality of radially extending openings 18 and/or 20 in the form of tapered grooves is not fractal elements as defined in the above-referenced application. Furthermore, Applicant respectfully submits that Grosshandler's cartridge or self-contained filter element with a frame defining a generally rectangular fluid passage opening 16 with a plurality of rigid foraminous sheets of materials and a layer of particulate sorptive also do not teach or suggest fractal elements. Therefore, either Gelman or Grosshandler does not anticipate the subject matter recited in claim 1.

For the reasons just explained, Applicant respectfully requests that the anticipation rejection under 35 U.S.C. § 102(b) of claim 1 be withdrawn and the claim passed to issuance.

35 U.S.C. § 103(a) Obviousness Rejections

(A) Applicable Authority

The basic requirements of a *prima facie* case of obviousness are summarized in MPEP §2143 through §2143.03, *i.e.*, in order "to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify

the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success in combining the references. Third, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the expectation of success must both be found in the prior art, and not based on Applicants' disclosure." *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Further, in establishing a *prima facie* case of obviousness the initial burden is placed on the examiner. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985). See also MPEP § 706.02(j) and § 2142.

The Supreme Court has established the standard of patentability to be applied in obviousness rejections in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966). This standard has been summarized in MPEP § 2141 into four factual inquires including "(A) determining of the scope and contents of the prior art; (B) ascertaining the differences between the prior art and the claims in issue; (C) resolving the level of ordinary skill in the pertinent art; and (D) evaluating evidence of secondary considerations." It should be noted that, when applying the required patentability standards of *Graham,* the basic considerations which apply to obviousness rejections based on 35 U.S.C. § 103 should include the following principles of patent law: "(A) the claimed invention must be considered as a whole; (B) the references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination; (C) the references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention; and (D) reasonable expectation of success is the standard with which obviousness is determined." *Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986).

(B) Obviousness Rejection Based on Gelman or Grosshandler

Claims 2 through 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Gelman or Grosshandler. Claims 2 through 6 are dependent on independent claim 1. Claim 7 is an independent claim and claims 8 through 15 are dependent thereon.

Claims 2 through 6, being dependent on claim 1, include every limitation recited therein. In particular, and among other recited elements, claims 2 through 6 include the limitations of fractal elements recited in claim 1. As explained hereinabove in conjunction with the anticipation rejection of claim 1, either Gelman or Grosshandler does not teach or disclose fractal elements. Therefore, Applicant respectfully submits that Gelman or Grosshandler cannot support a finding of obviousness of claims 2 through 6 because either reference does not teach or suggest the limitation of fractal elements included in claims 2 through 6 by dependency on claim 1.

In addition, Applicant respectfully submits that Gelman or Grosshandler does not support a finding of obviousness of claims 3 and 4 because neither reference teaches or suggest distributors having a population of fluid exits having a density greater than about 200 per square foot (claim 3) or about 200 per square inch (claim 4). The fact that the references does not teach or disclose the density of distribution exits was acknowledged in the Office Action (Office Action, page 3, lines 4-6). Nevertheless, the Office concluded that the density of distribution exits was a matter of choice in design without producing any new and unexpected result. Applicant kindly calls the Office attention to the table of experimental results included in the specification of the above-referenced application between paragraphs **[0069]** and **[0070]** detailing a performance comparison between a conventional system and the shallow bed invention of the above-referenced application. The high density of distribution of inlets and outlets provided by the fractal design of the instant invention provides a ten fold increase in flow rate while the required pressure drop to operate it is 30 to 50 times less than that used in conventional systems.

Therefore, Applicant respectfully requests that the obviousness rejection under 35 U.S.C. § 103(a) of claims 2 through 6 be withdrawn and the claims passed to issuance.

As to claims 7 through 15, Applicant respectfully submits that Gelman or Grosshandler does not support a finding of obviousness thereof because Gelman or Grosshandler does not teach or suggest all of the limitations recited in claims 7 through 15. In particular, considering

the independent claim 7, Applicant respectfully submits that Gelman or Grosshandler does not teach or suggest, among other recited limitations, the element of a fluid distributor constructed and arranged to introduce fluid at an inlet at a density of at least 200 distribution exits per square foot. As previously explained in conjunction with the obviousness rejection of claims 3 and 4, such element is not taught or suggested by the cited prior art references and they are not obvious matters of choice in design. Therefore, Gelman or Grosshandler does not support a finding of obviousness of claim 7. In addition, claims 8 through 15 are allowable, among other reasons, as depending either directly or indirectly from claim 7, which is allowable.

Further, Applicant respectfully submits that Gelman or Grosshandler does not teach or suggest the elements of (*i*) distributors and collectors being fractals (claims 9, 13, 14, 15); (*ii*) the ratio of diameter to height of a processing bed being at least 10:1 (claim 10); and (*iii*) flow conditions with a pressure drop across the bed of less than 5 psi (claim 11).

Therefore, Applicant respectfully requests that the obviousness rejection under 35 U.S.C. § 103(a) of claims 7 through 15 be withdrawn and the claims passed to issuance.

CONCLUSION

Claims 1 through 15 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicants' undersigned attorney.

Respectfully submitted,

Laurence B. Bond
Registration No. 30,549
Attorney for Applicant(s)
TRASKBRITT
P.O. Box 2550
Salt Lake City, Utah 84110-2550
Telephone: 801-532-1922

Date: January 28, 2003
LBB/csw

\\Traskbritt1\Shared\DOCS\2402-4283.1US\27473.doc